

What is claimed is:

1. A fluoropolymer composite with high ionic conductivity, applicable in the electroactive polymer composite, comprised by following
5 components:

PVDF-g-SPS;

PVDF; and

Hydrocarbon-elastomer.

10 2. The fluoropolymer composite with high ionic conductivity according to claim 1, wherein the manufacturing method for the PVDF-g-SPS is that the polystyrene is grafted onto the main chain of the macromolecular of the polyvinylidene fluoride resin that is then ionized by sulfonyl group to become ionomer.

15 3. The fluoropolymer composite with high ionic conductivity according to claim 1, wherein the fluoropolymer composite with high ionic conductivity may be cross-linked by any one of the two cross-linkers, that is, the compounds belonged to diamine or peroxide, and the amount of the cross-linker is around 0.5~5% of the entire weight of the composite, and the temperature of the cross-link is between 25°C to 200°C, and the pressure
20 range is 0~500psi.

4. The fluoropolymer composite with high ionic conductivity according to claim 1, wherein the molecular weight of the PVDF is between 80,000 and 350,000.

25 5. The fluoropolymer composite with high ionic conductivity according to claim 2, wherein the grafting rate for the styrene monomer onto the PVDF is between 10% to 100mole %.

6. The fluoropolymer composite with high ionic conductivity according to claim 1, wherein the hydrocarbon-elastomer may be poly ethyl acrylate, and its molecular weight is between 100,000 to 300,000.

30 7. The fluoropolymer composite with high ionic conductivity according to claim 2, wherein the sulphonating rate of the PVDF-g-SPS is between

30% and 100%.

8. The fluoropolymer composite with high ionic conductivity according to claim 7, wherein the sulphonating rate of the PVDF-g-SPS is between 60% and 100%.

5 9. The fluoropolymer composite with high ionic conductivity according to claim 1, wherein the weight proportion of the PVDF-g-SPS is between 10% to 60%, the weight proportion of the PVDF is between 15% to 50%, and the weight proportion of the hydrocarbon-elastomer is between 10% to 60%.

10 10. The fluoropolymer composite with high ionic conductivity according to claim 1, wherein the hydrocarbon-elastomer may be acrylic-elastomer, such as: poly ethyl acrylate or the derivatives of other alkyl, and the adding amount proportion is between 10% and 60% of the weight of total composite.

15 11. A fluoropolymer composite with high ionic conductivity, which is applicable in the electroactive polymer composite and is comprised by following three components:

PVDF-g-SPS;

PVDF; and

20 Fluoro-elastomer.

12. The fluoropolymer composite with high ionic conductivity according to claim 11, wherein the manufacturing method for the PVDF-g-SPS is that the polystyrene is grafted onto the main chain of the macromolecular of the polyvinylidene fluoride resin that is then ionized by 25 sulfonyl group to become ionomer.

13. The fluoropolymer composite with high ionic conductivity according to claim 11, wherein the fluoropolymer composite with high ionic conductivity may be cross-linked by any one of the two cross-linkers, that is, the compounds belonged to diamine or peroxide, and the amount of the cross-linker is around 0.5~5% of the entire weight of the composite, and the temperature of the cross-link is between 25°C to 200°C, and the pressure range is 0~500psi.

14. The fluoropolymer composite with high ionic conductivity according to claim 11, wherein the molecular weight of the PVDF is between 80,000 and 350,000.

15. The fluoropolymer composite with high ionic conductivity according to claim 12, wherein the grafting rate for the styrene monomer onto the PVDF is between 10% and 100mole %.

16. The fluoropolymer composite with high ionic conductivity according to claim 12, wherein the sulphonating rate of the PVDF-g-SPS is between 30% and 100%.

10 17. The fluoropolymer composite with high ionic conductivity according to claim 16, wherein the sulphonating rate of the PVDF-g-SPS is between 60% and 100%.

15 18. The fluoropolymer composite with high ionic conductivity according to claim 11, wherein the weight proportion of the PVDF-g-SPS is between 10% to 60%, the weight proportion of the PVDF is between 15% to 50%, and the weight proportion of the hydrocarbon-elastomer is between 10% to 60%.

20 19. The fluoropolymer composite with high ionic conductivity according to claim 11, wherein the molecular weight of the fluoro-elastomer is between 80,000 and 2,800,000.

25 20. The fluoropolymer composite with high ionic conductivity according to claim 11, wherein the fluoro-elastomer may be Viton or polymer of vinylidene fluoride /hexafluoropropylene/tetrafluoroethylene, and the proportion of its adding weight is between 10% and 60% of the weight of total composite.